

**COUNTY OF NAPA
HEALTH and HUMAN SERVICES AGENCY
EMERGENCY MEDICAL SERVICES AGENCY**

**TRIAL STUDY
ANGWIN EMT-II MODULAR
FORMERLY CALLED: EMT-I ADVANCED SCOPE OF PRACTICE**

18 MONTH REPORT

JUNE 15, 2002

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PROJECT ABSTRACT REPORT

In January of 2000, an EMT-I Advanced Scope Trial Study was approved for the rural portion of Napa County covered by Angwin Community Ambulance Service (ACA). In addition to the approximate 6,500 full time residents in this area, up to 30,000 people visit the recreational sites around Lake Berryessa each year. Since much of this rural portion of Napa County is 30-45 minutes from the nearest Advanced Life Support unit, a trial study was developed to determine the efficacy of EMT-I Advanced Scope response in this area.

Prior to the implementation of the trial study, selected Angwin Community Ambulance EMT-I's were screened and then completed an initial training program. This program included didactic instruction, clinical time in a hospital emergency room, and field instruction on an Advanced Life Support unit. 5 Angwin Ambulance personnel completed the training process and became approved advanced scope providers.

Approved advanced scope personnel were required to complete 48 hours of continuing education every two years, as well as attend bi-monthly run review sessions. During the 18 month trial study period, the 5 approved advanced scope personnel averaged 71 hours of continuing education.

Approved advanced scope providers were allowed to treat patients within 7 advanced scope protocols. These included Allergic Reaction and/or Anaphylaxis, Altered Mental Status, Cardiopulmonary Arrest, Chest Pain (cardiac origin), Near Drowning/Drowning, Poisoning, and Respiratory Distress. For patients falling within these protocols, advanced scope providers were allowed to use the following advanced scope medications: Activated Charcoal, Albuterol, Aspirin, Epinephrine S.Q., Glucagon, Naloxone, and Nitroglycerine. These personnel were also allowed to use Combitube airways and determine blood glucose levels with finger sticks and glucometers.

Quality assurance was on-going throughout the trial study. Each advanced scope call was reviewed by the Angwin Community Ambulance Training Coordinator, the receiving hospital, as well as EMS Agency staff. All calls were audited for patient assessment, protocol compliance, documentation, performance of field interventions, and congruence with hospital diagnosis. Each call was also reviewed at Angwin Community Ambulance's monthly run review sessions.

The Angwin Advanced Scope EMT-I Trial Study began on December 15, 2000, and ended June 15, 2002. During the study period, Angwin Community Ambulance transported 353 patients. Of this number, 34 patients were treated with advanced scope procedures and/or medications. The majority of advanced scope patients were treated under the Altered Mental Status protocol and had their blood glucose level determined with a glucometer. Patients were treated within all the approved advanced scope protocols during the study period except Allergic Reaction and/or Anaphylaxis, and Near Drowning/Drowning.

Complete analysis of the advanced scope calls during the trial study showed that the majority of patients who received advanced scope medications improved after

administration, and that most patients treated within an advanced scope protocol were admitted. The advanced scope patient contact time prior to ALS (rendezvous with an advanced life support unit or arrival at the emergency room) was 14 minutes. No errors with any advanced scope medication or procedure were identified on any of the advanced scope calls.

The Angwin EMT-I Advanced Scope Trial Study showed the efficacy of a small, motivated advanced scope provider. Advanced scope personnel responded on 91% of the calls during the trial study. Analysis showed that patients were treated appropriately within the advanced scope protocols, that some patients improved in response to treatment, and that all skills performed were done so appropriately. In addition, the Angwin trial study had no negative impact on the community or EMS system. Angwin Community Ambulance Service provided all continuing education to the advanced scope personnel during the trial study and fully participated in the on-going quality assurance processes. The result has been an increase in the level of care with no additional cost to the community.

It is the recommendation of the Coastal Valleys EMS Agency that the Angwin EMT-I Advanced scope program be added as optional skills for Angwin Community Ambulance in the current Angwin response area. Although the number of patients requiring advanced scope treatment has been small, Angwin Community Ambulance has shown that it can maintain a highly motivated and competent staff of Advanced Scope personnel - therefore increasing the level of care provided to patients in this rural portion of Napa County.

INTRODUCTION

On December 15, 2000, Napa County began an 18 month EMT-I Advanced Scope Trial Study with Angwin Community Ambulance Service (ACA). The trial study utilized specified advanced skills and medications for use by specially selected and trained EMT-I Advanced Scope personnel. The Imperial County Rural EMT-I Expanded Scope study was used as a model.

The EMT-I Advanced Scope study was initially proposed by Angwin Community Ambulance Service due to the fact that some portions of their response area are 30-45 minutes from the closest ALS unit. Due to the remote location and limited access to ALS response, this study was proposed to determine the efficacy of EMT-I Advanced Scope response in this rural portion of Napa County.

Angwin Community Ambulance Service is a non-profit, community supported volunteer ambulance service that serves the communities of Angwin, Pope Valley, Chiles Valley and Berryessa Estates. Angwin Community Ambulance also serves the northern portion of Lake Berryessa. These communities have a stable population of approximately 6,500 people. Pacific Union College is located in the Angwin community with a student population of approximately 1500. The summer months at the northern Lake Berryessa resorts provide recreational activities for a visitor population of approximately 30,000. See map (Attachment A).

Prior to beginning the trial study, statistics showed that a significant number of the residents in the Angwin response area suffer from chronic illnesses, and that EMS responses in these communities involve conditions that may benefit from EMT-I advanced treatment, including chest pain and respiratory distress.

The trial study allowed Angwin Community Ambulance to equip their ambulances with EMT-I Advanced Scope medications and supplies, and to respond to EMS calls with EMT-I Advanced Scope trained personnel when available. After initial response from advanced scope personnel, patients could be transported by Angwin Ambulance and personnel alone, by Angwin Ambulance accompanied by a paramedic following an ALS ground rendezvous, or by EMS Air; the method of transport depending on the patients condition and/or distance to the receiving hospital.

The trial study was approved by the State EMS Authority on January 3, 2000 and officially commenced on December 15, 2000. The 18 month trial study period ended June 15, 2002. This report will include a description of the initial project including advanced scope training, protocols, continuing education, and quality assurance. Information collected during and after the study will also be presented and analyzed. This report will end with our recommendations for the future.

PROJECT DESCRIPTION / METHODOLOGY

I. TRAINING

Initial Selection / Training

Advanced scope EMT's were selected based on previous satisfactory performance as both an EMT-I (basic) and EMT-D's with Angwin Community Ambulance. Also considered in the selection process was the candidates likelihood to remain in the community. Candidates who were selected to continue after the initial screening were given and required to pass a pre-test.

Candidates who successfully passed the screening and testing process were then placed in the trial study training class. The initial training program as approved included:

1. 43 hours of didactic education.
2. Four 8-hour clinical sessions in the emergency department.
3. Four 8-hour sessions on an Advanced Life Support unit (with a minimum of five advanced scope patient contacts).

Five Angwin Community Ambulance personnel completed the training and were approved as EMT-I's with Advanced Scope.

See Attachment B (training outline) for further details of the initial training program.

Continuing Education

Continuing education during the trial study was provided by the Angwin Community Ambulance Training Coordinator.

In order to maintain certification, approved EMT-I's with advanced scope of practice were required to participate in continuing education. Angwin Community Ambulance Service held monthly training and run review sessions which included structured training in both EMT-I basic and EMT-I advanced knowledge and skills, as well as run reviews. The initial trial study required that advanced scope personnel complete 48 hours of continuing education every 2 years, as well as attendance at 6 run reviews per year. During the 18 month trial study period the 5 approved advanced scope providers averaged 71 hours of training. All 5 personnel approved as EMT-I Advanced Scope providers met the continuing education requirements set for the study.

II. ADVANCED SCOPE OF PRACTICE

Following the initial selection and training process, authorized EMT-I Advanced Scope personnel to utilize the following expanded scope procedures and medications:

Procedures:

- ✍ Double Lumen Airway Device (Combitube)
- ✍ Automated External Defibrillator
- ✍ Determination of blood glucose levels via glucometer

Medications:

- ✍ Albuterol, metered dose inhalers or nebulized
- ✍ Activated Charcoal
- ✍ Aspirin
- ✍ Epinephrine via EpiPen (or similar device)
- ✍ Glucagon
- ✍ Naloxone
- ✍ Nitroglycerin, metered dose spray

The Trial Study allowed for advanced scope procedures and/or medications to be used in clinical conditions falling within the following treatment protocols (see Attachment C for complete protocols):

- ✍ Allergic Reaction and/or Anaphylaxis
- ✍ Altered Mental Status
- ✍ Cardiopulmonary Arrest
- ✍ Chest Pain (suspected cardiac origin)
- ✍ Near Drowning/Drowning
- ✍ Poisoning
- ✍ Respiratory Distress

III. MEDICAL CONTROL / QUALITY ASSURANCE

Medical control during the trial study period was maintained through several methods. On-line prospective medical control was provided by direct field to base radio/phone communication with the receiving hospital. Off-line retrospective medical control was maintained by the EMT-I Advanced Scope of Practice Treatment Protocols, as well as oversight and review by the Receiving/Base Hospital (Registered Nurse and/or MD), Angwin Community Ambulance Training Coordinator, and the Napa County EMS Agency staff. All calls involving the use of advanced scope protocols, procedures, and/or medications were reviewed by these agencies/personnel.

Each call in which an advanced scope procedure and/or medication was utilized were reviewed using the approved run review form as a guide (see attachment D). The Angwin Community Ambulance Training Coordinator, Base Hospital Coordinator, and Napa County EMS Agency personnel each complete a designated section of this form.

As part of their on-going continuing education process, Angwin Community ambulance service personnel reviewed each advanced scope call during monthly training and run review sessions. ACA dedicates one training session each month to advanced scope topics and run reviews.

In addition to the quality assurance activities during the trial study, the EMS Agency Medical Director and staff conducted a thorough review of all EMS responses by Angwin Community Ambulance during the trial study period. A standard audit form was completed for each response (see attachment E)

DATA COLLECTION AND ANALYSIS

I. Information on all calls during Trial study period

After completion of the trial study period, all Angwin responses were reviewed by the EMS Agency staff. In this section, the information obtained from this review, as well as information collected during the study period, is presented.

During the trial study, Angwin Community Ambulance Service responded to a total of 388 emergency medical responses. Of these responses, 98% (373) were code three responses. Other general Information regarding these responses:

- ✍ 62% were for medical complaints
- ✍ 38% were for traumatic incidents
- ✍ The age breakdown of patients was as follows:
 - 0-15 = 10%
 - 25-45 = 36%
 - 45-65 = 22%
 - 65+ = 32%
- ✍ A total of 351 patients were transported by the method as listed in the following chart:

Transport Information				
Agency	All Calls		Advanced Scope	
Angwin Only	234	67%	5	15%
ALS Intercepts	100	28%	27	82%
Air Transport	13	4%	1	3%
ALS Intercepts with Air Transport	4	1%	0	0%
Total	351	100%	33	100%

Chart 1

The determination to request an ALS intercept is made by Angwin Community Ambulance personnel based on the location of the call, mechanism, and/or description of complaint. ALS Aircraft requests can be made by several sources, including Angwin Community Ambulance personnel, law enforcement, Fire, or one of the two dispatch centers (Napa Central or CDF/Napa County Fire).

In cases in which ALS Intercept is used, Angwin Community Ambulance transports with paramedics from an ALS provider. The ALS unit will either meet Angwin at the scene or rendezvous after Angwin Ambulance begins transport. Transport by air providers takes place either directly from the scene, or after Angwin Ambulance transports the patient to the EMS Aircraft landing site.

II. Advanced Scope Calls

A total of 34 responses involved the use of advanced scope procedures and/or medications. The average patient contact time of Angwin prior to the arrival of advanced life support (an ALS ambulance or arrival at the emergency room) was 14 minutes.

The following chart shows a breakdown of the Advanced Scope Treatment Protocols utilized during the trial study period:

Treatment Protocol Used	
Policy	Number of times used
EMT-Altered Mental Status	20
EMT-Cardiac Arrest	2
EMT-Chest Pain	3
EMT-Poisoning/Overdose	2
EMT-Respiratory Distress	7

Chart 2

The advanced scope treatment protocols not used during the trial study period were:

- ✍ Allergic Reaction and/or Anaphylaxis
- ✍ Near Drowning/Drowning

The next chart shows a breakdown of the advanced scope procedures and/or medications used during the trial study period.

Advanced Scope Medications / Procedures	
Procedure / Medication	Number of calls
Activated Charcoal	2
Albuterol	7
Aspirin	2
Blood Glucose Check	20
Combitube	2
Epinephrine, S.Q.	1
Nitroglycerine S.L.	3

Chart 3

The approved advanced scope medications not used during the study period were Glucagon and Naloxone. No patients received defibrillatory shocks by Angwin AED's during the study period, although one cardiac arrest victim did receive defibrillatory shocks by a first responder fire agency prior to the arrival of Angwin Advanced Scope personnel. Although only one of the blood glucose determinations resulted in the treatment of hypoglycemia (with oral glucose), this procedure was effective in ruling out hypoglycemia in several significantly altered patients, as well as determining a high blood glucose level in several other cases.

Of those patients treated with advanced scope medications, the response to treatment was as follows:

Response to Advanced Scope Medications		
Improved	7	64%
No Response	3	27%
Worsened**	1	9%

Chart 4

Of the patients who improved after advanced scope medications, 5 were respiratory patients who were treated with Albuterol (in one case Albuterol + Epinephrine S.Q.), and 2 chest pain patients who improved after the administration of Nitroglycerine.

**The case that worsened was a patient in severe respiratory distress who continued to deteriorate after (not in response to) the administration of Albuterol.

Of the patient contacts in which advanced scope treatment was provided, the patient disposition was as follows:

Advanced Scope Patient Disposition		
Admitted	17	59%
Home	8	28%
Transfer	2	7%
Coroner	2	7%

Chart 5

As previously presented, 5 Angwin personnel completed the selection and training process and became approved Advanced Scope providers. Despite this small number of Advanced Scope personnel, Advanced personnel responded on 91%** of Angwin Community Ambulance responses. A total of three calls were identified as possibly requiring advanced scope treatment when no advanced scope provider was available.

**Advanced Scope personnel were available for some of the other 9% of calls but did not respond due to the chief complaint and the low likelihood of advanced scope treatment being required.

III. Summary

As the data demonstrates, approximately 10% of the patients transported by Angwin Community Ambulance were treated within an EMT-I Advanced Scope protocol during the 18 month trial study period. Some other facts from the trial study review include:

- ✍ Five personnel were trained and certified to work as EMT-I Advanced Scope providers.
- ✍ Advanced scope personnel responded to 91% of Angwin Community Ambulance Services responses during the Trial study period.
- ✍ Of the patients treated, the majority had care transferred to ALS personnel after an ALS rendezvous with an average contact time (prior to ALS) of 14 minutes.
- ✍ The majority of patients who received an advanced scope medication improved after administration.
- ✍ The majority of patients treated with an Advanced Scope protocol were admitted to the receiving hospital after arrival.
- ✍ Only one glucometer reading showed a low blood glucose reading that resulted in treatment but the use of glucometers was useful in ruling out low blood glucose in a number of calls.
- ✍ Although only two patients required the use of a Combitube, in both cases the decision to use a Combitube was appropriate, and in both cases the placement was successful.
- ✍ No errors involving advanced scope skills, medications, or protocols were identified.

Page 10-A contains detailed information regarding each of the 34 advanced scope calls.

CONCLUSION / RECOMMENDATIONS

I. Conclusion

The EMT-I Advanced Scope Trial Study demonstrated the benefit to patient care of advanced scope personnel and protocols in rural Napa County. The review of the trial study period showed that the study was successfully implemented and maintained with no significant negatives or additional costs to the community.

Angwin Community Ambulance Service's commitment to the improvement of patient care was instrumental to the successful implementation of this project. In addition to participating in the initial study research and completion of the initial project proposal, ACA also trained their staff, implemented, and then maintained the Advanced Scope Trial Study with little outside support. This was also done with no additional cost to the community.

II. Recommendations

It is the recommendation of the Coastal Valleys EMS Agency that the EMT-I Optional Scope skills used in the EMT-II Modular Trial Study be approved for continuation for an additional 18 months for use within their current response area. The trial study has shown that Angwin Community Ambulance can successfully maintain an EMT-II Modular Trial Study, and that this program can be beneficial to patient care in the rural portion of Napa County covered by Angwin Community Ambulance Service.